custom—will be accompanied by a more or less complete reference reading list.

But these articles should, and no doubt will, accomplish much more than this. Surely they will if our readers will help with suggestions both as to subjects and authors. Readers will assist the cause of better health for everyone everywhere all the time, and assist CALIFORNIA AND WESTERN MEDICINE in serving that cause, by sending suggestions and comment to the editor. Physicians in general practice away from the great teaching centers are particularly invited to send suggestions regarding subjects or authors, or both, to the editor.

ABSORPTION OF LOCAL ANESTHETICS FROM THE BLADDER

The mucosa of the bladder is generally regarded as a relatively poor absorbing surface for all kinds of agents, including local anesthetics. The local anesthetics, however, act sufficiently to abolish pain in this region, and this is practically tantamount to saying that absorption occurs. Moreover, the not infrequent occurrence of systemic reactions or disturbances from the employment of local anesthesia in the bladder confirms the assumption of absorption. The possible occurrence of toxic reactions is of much concern to the physician. The employment of such an agent as epinephrine, together with cocaine, to prevent or retard the absorption of the anesthetic does not always mitigate the toxicity arising from local anesthesia. On the contrary, the systemic reactions under these conditions may even be augmented, especially if the epinephrine is reinjected into the tissues, or injected systemically for resuscitation. This is due to the well-known sensitizing action of cocaine (even in small and relatively ineffective doses) to epinephrine. Hence, it is of the greatest importance to bear in mind the important function of absorption, which in the bladder is probably subject to a greater number of influences, such as chemical reaction, variable composition of urine, etc., than in other regions of the body.

The results of studies on bladder absorption of local anesthetics in different animals are variable, if not contradictory. The variability of the results reported may be attributed to the employment of different species and methods, and criteria of absorption by the investigators. In his studies on dogs, Macht of the Johns Hopkins Medical School, who reported on this subject a few years ago, used changes in blood pressure and respiration as the criteria of absorption. Macht concluded that cocaine and alypin were not demonstrably absorbed from the bladder. However, the very recent and extensive studies of Saito from the Pharmacological Institute in Koenigsberg indicate that there is considerable bladder absorption of all local anesthetics and some other agents.

Saito employed rabbits and the chemical analytical methods of the German Pharmacopoeia for quantitative estimation of the anesthetics. This direct method appears to be better suited for settling the question of absorption than the indirect method of Macht. Saito used more than ordinary precautions in the conduct of his experiments. Before the anesthetic was placed in the bladder both ureters were ligated close to the bladder, and the penis was also tied off. Next, the bladder was opened by an incision and washed with isotonic sugar solution through a catheter. Then a definite quantity of the anesthetic was introduced; the wound was closed, and the animal kept warm during the experiment. At the end of definite time intervals, the unabsorbed solution in the bladder was carefully removed and the quantity of the anesthetic left behind determined. Under these conditions, Saito found that 60 per cent of alypin and 45 per cent of cocaine were absorbed in three hours. Only 15 per cent of novocaine (procaine) was absorbed during the same period, this anesthetic being more slowly absorbed and not destroyed or diffused. The concentrations of the anesthetics used were 1 and 2 per cent, and absorption was roughly proportional to the concentration. Weak alkalinization (pH = 8.0) of the solutions considerably increased the absorption, and this agreed with the well-known improvement in anesthetic efficiency of cocaine when mixed with bicarbonate. That is, in the presence of alkali the alkaloid base is liberated and better absorbed by the mucosa. Strychnine was found by Saito to be absorbed rather slowly, only 36 per cent being removed in three hours. The absorption of sodium chloride solution in concentrations less than 1 per cent was better than with higher concentrations. Saito also observed that the introduction of salt solution, together with the anesthetic, into the bladder did not alter the quantitative absorption of the salt or of the anesthetic.

The results of Saito on rabbits leave no doubt that the absorption of local anesthetics from the bladder occurs. To what extent the results are transferable to man cannot be said. However, they suggest the possible existence of a similar function in the human bladder, and, at least, indicate the desirability of securing further information regarding the behavior of this important organ toward an active and widely used group of drugs. In any case, caution and care should be exercised in the use of local anesthetics in the genito-urinary tract, for the neighboring regions, namely, the ureters, urethra and prepuce, are even better absorbing surfaces than the bladder.

Macht, D. I.: Journ. Pharm. Exp. Therap., 1921, 16:435, "On the Absorption of Local Anesthetics through the Genito-Urinary Organs."

Saito, Y.: Arch. exp. Path. Pharm., 1924, 102:367, "Die Resorption örtlich betäubender Mittel von der Schleimhaut der Harnblase."

DOCTORS GIVE EVIDENCE

Of all the damaging influences operating against physicians there is none more serious than that brought about through so-called medical testimony. At the present time the whole profession is being criticized again, and individuals are being designated as shyster doctors in editorials from one end of our country to another—and to a degree, justly so. As one editor puts it, *"when doctors, who above all people should be human, honest and judicial in weighing evidence, in culling the false from the true, and in arriving at just and fair decisions, become biased advocates and even dishonest advocates of any cause or any person, for money, they ought to have*